Preface

The Internet of Things (IoT) is upon us and touches almost every industry! Current forecasts predict that there will be more than 50 billion devices connected to the Internet by 2020 and it looks like this is just the beginning. What is highly interesting with this technology trend is that it is more defined by what it enables rather than the technology itself. This is because IoT enables all kinds of smart objects (e.g., smart sensors and actuators) to communicate and interact with each other across different networks and domains. As such, a plethora of new services and applications are possible and must be created revealing the potential to create substantial new markets and to stimulate existing ones.

However, it is also clear that on the way to a fully connected cyber-physical world, numerous challenges have to be addressed. Do we have the technology and experience to make IoT reality? What kind of technology is actually missing? Do we need new hardware technology, new tools and programming languages, new network protocols, new services, and new data management techniques? To sum up, do we really need new technology or is IoT just a matter of ensuring interoperability among existing technologies or do we maybe need a paradigm change in technology and design methods? As with every new technology wave, we are witnessing a debate regarding industry standards striving to find a position in the IoT marketplace.

The intention of this book is to shed some light on all those questions. Certainly, one book cannot cover all topics related to the trends in IoT. Since IoT is in fact in its infancy, we see this book as an ongoing effort to offer the current trends and open issues in the area and also to sketch the future of IoT; we are strongly convinced that the IoT industry will not stop until your tablet, smartphone, or smartwatch is downscaled enough so they fit on your eyes or your wrist.

The book is organized in five main sessions covering the whole spectrum of the IoT technologies. The first four parts of the book are:

- Platforms and Design Methodologies for IoT Hardware
- Simulation, Modeling, and Programming Frameworks for IoT
- Opportunities, Challenges, and Limits in WSN Deployment for IoT
- Efficient Data Management and Decision Making for IoT

The last part of the book is devoted to the description of four IoT use cases and includes also an additional chapter offering our view on various IoT projects funded by the European Commission under the Horizon 2020 work program.

The editors would like to thank all the authors of the individual chapters of the book and also the program committee of the International Conference on Field-Programmable Logic and Applications (FPL), 2015. The conception of writing this book was born in the course of the First International Workshop on Components and Services for IoT Platforms (WCS-IoT 2015), held in conjunction with FPL 2015 (http://esda-lab.cied.teiwest.gr/wcs-iot/).

We would especially like to thank the members of the organizing committee of the WCS-IoT workshop: their contribution and participation in this effort as well as their experience have led to a very successful program for the workshop. In this book, we included all papers presented in the workshop.

Finally, we would like to state that we strongly believe that this effort should be followed up by additional workshops and conferences in the future focusing on the existing and evolving IoT standards: every industry can benefit from IoT deployments but must adhere to a myriad of existing technology and regulatory constraints plus a new set of policy considerations. The latter will be especially true in the new IoT vertical markets.

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